

ally employing that possess actions which would cause one to predict that they would be of special use in controlling the terrible spasms of hydrophobia, *e.g.*, bromide of potassium, chloral, and Calabar bean. These drugs all diminish in a signal manner the reflex excitability of the nerve-centres; and the second in the list possesses in addition powerful properties as a hypnotic; they have all been used in the treatment of hydrophobia; and one of them—chloral—has, in sufficiently large doses, been successfully used, in so far as relief of suffering was concerned. But as for a *cure* for hydrophobia it has yet to be discovered; and this remark applies to all zymotic diseases. The majority of these diseases, unlike hydrophobia, tend naturally towards recovery rather than death, and the physician is undoubtedly able, by judicious measures, to obviate the tendency to death. He cannot *cure* the disease, however, in the sense in which he might be said to cure it were he able to destroy the poison which is its cause; apparently, once introduced into the system the poison must produce its effects—intense or slight—which must have a certain course, and then cease, because the poison which induced them has passed away, or because the soil which nourished the poison supplies it no longer with the conditions which it required. But the day may come, and we believe will come, when even this great result may be achieved; when not only shall we know the conditions which attend the spread of zymotic diseases so accurately that we shall be able to prevent their spread, but when medicine may supply us the means of dealing directly with the *materies morbi* of the diseases, as, for instance, by “sterilising” the soil in which they are implanted.

Our general review of the main facts in the history of rabies and hydrophobia has naturally brought out with considerable clearness how little is known concerning it, and how much remains to be done. We hail, therefore, with satisfaction the appointment of a Committee of the British Medical Association charged with the investigation of this important and interesting subject. This Committee consists of Dr. Lauder Brunton, Mr. Callender, Mr. Ernest Hart, and Prof. Burdon-Sanderson.

Before concluding, a few words concerning the measures to be adopted for preventing the spread of hydrophobia.

From our insular position we are in a better position than any neighbouring nation for holding a check, or even “stamping out” such a disease as hydrophobia, which, as the vast mass of evidence tends to show, does not originate spontaneously, nor does it appear that it would be difficult to effect this result were the suggestions which have been made by several recent writers carried into effect. It is certain that the number of dogs kept in England is enormously in excess of any requirements, and it is equally certain that this state of matters might promptly be put a stop to. The existing dog tax need not be increased in amount, but it should be enforced in the most stringent manner, the business of collecting, prosecuting, &c., being handed over to the police authorities of each district. Each dog should have a separate number on the local register, and might be the wearer of a collar bearing its registered number. Further, the licence should bear a description of the premonitory symptoms of rabies, and owners of dogs should be cautioned instantly to report any suspicious case to the police. These regulations

would, as a necessary result, lead to each dog being individually looked after and cared for, and would, we believe, in the course of very few years, lead to the disappearance of rabies.

DIEN'S “CELESTIAL ATLAS”

Atlas Céleste, comprenant toutes les Cartes de l'ancien Atlas de Ch. Dien. Rectifié, augmenté, &c., par Camille Flammarion. 3^e édition. (Paris: Gautbier-Villars, 1877.)

THIS is a new and enlarged edition of Dien's “Atlas Céleste,” which first appeared in 1864, with the co-operation of M. Babinet, and is brought out under the editorship of M. Camille Flammarion. That the formation of the atlas, both in its original and extended plan has involved a great amount of labour will be evident upon a very superficial examination. The first issue was said to contain upwards of 100,000 stars and nebulae, of which 50,000 had been observed by Lalande, projected on the development of a sphere, sixty-five centimètres in diameter, their places being reduced to the year 1860, and this scale was stated to be sufficiently large to allow of the insertion without confusion of all stars to the ninth magnitude inclusive. The charts were said to contain “nearly the totality of stars in the catalogues of Lalande, Herschel I., Piazzi, Harding, Struve, Bessel, Herschel II., Groombridge, and Argelander,” while for the southern heavens recourse was had to the catalogues of La Caille and Brisbane. This description of the authorities consulted is not very definite. The reference to Harding must apply to his atlas; that to Bessel may be supposed to at least include the catalogue of equatorial stars observed by the Königsberg astronomer, which was prepared by Weisse of Cracow, and published in 1846, if not the second catalogue founded upon Bessel's observations, containing stars from 15° N. to 45° N. declination, also reduced by Weisse, which appeared in 1863. The reference to Argelander is especially indefinite; we have the well-known catalogue of 560 stars, and the “Uranometria Nova,” but previous to the year 1864, when “Dien's Atlas” was published, astronomers were also in possession of vols. 3, 4, and 5 of the “Durchmusterung,” with the results of the survey of the whole northern heavens.

The programme originally prepared was a very extensive one. The new edition is stated to have received numerous corrections and considerable enlargement to bring up the work to the actual state of astronomical science, and there is sufficient evidence that an attempt has been made in this direction, but we regret to have to express the opinion, after a close examination of the “Atlas,” that in its present state it does not fulfil the programme upon which it was formed. It will soon be evident, on comparing the maps with the charts issued by the Berlin Academy, or more generally with those in the original edition of Harding's Atlas, that so far from containing stars to the ninth magnitude inclusive, numerous eighths, and even stars of 6·7 magnitude, are omitted, and it is not easy to see from what cause. It might be inferred that Bessel's catalogue of equatorial stars had not been utilised, since stars of the seventh and eighth magnitude observed by Bessel and not observed by Lalande, are wanting. But in addition we soon miss stars that do occur in the “Histoire Céleste,” as for

instance L. 39836, a star which Lalande considered a sixth magnitude.

Different views will be taken with regard to the proper contents of a celestial atlas, intended for general use, and it is not therefore desirable to be too critical upon this point, but to take, we will say, two extreme uses to which an atlas of the pretensions of Dien's may be applied, first for following a small planet with the aid of a chart professing to contain stars to a less degree of brightness, and secondly, for identifying the naked-eye stars by the general maps including only these brighter stars, an elementary purpose for which an atlas may be quite as readily adapted as a globe. In the former case Dien's maps are not sufficiently filled in to allow of a planet equalling in brightness stars of Bessel's ninth magnitude being identified without some trouble and disappointment, and in the latter case we meet with a failing which is only too common with star-atlases—the outlines of constellations are so prominently drawn as seriously to interfere with, if not entirely to obliterate the naked-eye stars of the lower magnitudes, in using the "Atlas" in the open air. As a model of what an atlas should be in the latter respect, we must still refer to Argelander's "Uranometria," which, in our opinion, has yet no equal for the more elementary uses of such a work.

Among the best features in the new edition of Dien's "Atlas" are the delineation of the southern heavens, in which Brisbane's stars are laid down, the view of the distribution of double and multiple stars by M. Flammarion, the orbits of some of the principle revolving double-stars, and figures of remarkable nebulae and clusters of stars.

OUR BOOK SHELF

Horticulture. By F. W. Burbidge. With Illustrations. (London: E. Stanford, 1877.)

THIS is one of the series of small handbooks on the British manufacturing industries, edited by Mr. G. Phillips Bevan, of which we have already noticed several volumes. A compact work on practical gardening, to serve as a guide to the amateur gardener and fruit-grower, was much wanted, and this volume to a certain extent supplies the desideratum. After a short chapter on commercial gardening, the author treats of the cultivation of fruit, and of the various descriptions of vegetables and herbs; and then of gardening in its various departments, but more from the economical than from the amateur's point of view. If the owner of a garden wants to turn his bit of land to the most profitable account, he will find Mr. Burbidge an admirable guide; but if he infers from the title of the book that he will obtain from it advice as to the treatment of his pelargoniums, fuchsias, and chrysanthemums, or the management of his hothouses, he will be disappointed. We fancy that information of this kind would commend itself to a larger number of readers than the guide-book information of the exact number of acres in each of our London parks, and the annual cost of maintaining them. The advice as to the culture of fruit and vegetables seems to us very good; but the rather poor woodcuts do not add to the value of the volume.

Mittheilungen aus dem k. zoologischen Museum zu Dresden. Herausgegeben mit Unterstützung der General-direction der königlichen Sammlungen für Kunst und Wissenschaft, von Dr. A. B. Meyer, Director des königlichen zoologischen Museums. Zweites Heft mit Tafel. (Dresden, 1877.)

IN a former volume of NATURE (vol. xiii., p. 464) we have

given some account of the origin of this meritorious work, of which the second portion is now before us. Like the former half of the first volume of the contributions the present section is chiefly occupied with memoirs based upon the collections made by Dr. A. B. Meyer during his well-known expedition to New Guinea and the adjacent islands. Herr Th. Kirsch, the entomologist of the Dresden Museum, commences with two articles upon the lepidoptera and beetles collected by Dr. Meyer in New Guinea. Of the former Herr Kirsch enumerates 167 species, of which 133 belong to the diurnal section. Several novelties are described and well figured. The next article is by Dr. Meyer himself, and gives us an account of a large series of Papuan skulls which he collected on the mainland of New Guinea and in the Island of Mysore, in the Bay of Geeldink. The collection, embracing altogether 135 examples, is, we believe, by far the finest of this branch of the human family ever made, and should, we suppose, lead to some definite results upon that somewhat mysterious subject—the differentiation of the various races of mankind by their skulls. A second article by Dr. Meyer relates to the specimens of anthropoid apes in the Dresden Museum. We cannot say that the photographic plates of the stuffed specimens of these creatures are either elegant or likely to be of very great use, but it is satisfactory to have the vexed question of the identity of the celebrated "Mafoka" lately living in the Zoological Gardens at Dresden, and long supposed to be a gorilla, finally set at rest, as is done by von Bischoff's article on its anatomy, which follows that of Dr. Meyer. A memoir on the Hexactinellid Sponges collected by Dr. Meyer in the Philippine Seas, in the preparation of which Herr W. Marshall has given his assistance, concludes this interesting volume, of which we may say that it adds materially to the status of the Dresden Museum, and to the scientific fame of its energetic director.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications. The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.]

The Radiometer and its Lessons

I AM obliged to ask you to allow me to add a few words, by way of further explanation, to my letter printed in NATURE, vol. xvii. p. 80.

In trying to estimate the effect of the communication of heat between a solid body and contiguous gas, I have assumed that certain simplifying suppositions may be legitimately made, for the most part identical with what are very commonly adopted in discussing the pressure exerted by a gas on a solid in contact with it. That is to say, I have assumed, first, that we may resolve the velocities of the molecules of gas into three rectangular components, one perpendicular to the surface of the solid and the other two parallel to it; second, that we may conceive of the whole number of molecules as divided into three equal parts, one-third moving in the direction of each of the resolved components of the velocity respectively; third, that the mutual pressure between the solid and the gas, and any communication of heat from one to the other, may, for the purpose in hand, be attributed to direct impacts of molecules against the solid surface; fourth, that all the molecules endowed with a velocity perpendicular to the solid surface, and contained within a layer adjacent to this surface of a thickness not greater than the mean length of path, will strike the surface, while none of those which are outside this layer will ever reach it; fifth, that the particles which have struck the solid surface will return from it with an average velocity corresponding to the temperature of the surface, and will retain this velocity until they arrive at the farther side of the layer before-mentioned. It was on the supposition that these are legitimate assumptions that